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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,232	07/02/2003	Philip M. O'Larey	TWC-2026	4862

7590

07/26/2005

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EXAMINER
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LIN, ING HOUR

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/612,232

Applicant(s)

O'LAHEY ET AL.

Examiner

Ing-Hour Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-64 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 21, 51, 55, 58 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 21, "C-103" is either unclear or redundant with the composition of alloy in claim 46. In claims 51, 55, 58 and 62, "hydride dehydride" is unclear because it is not supported in the specification.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-7, 9-20 and 22-35, 37, 40-43, 45-46, 49, 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al.

Fife (col. 1, lines 33+) teaches the claimed method for producing metal fibers from any suitable metal of Groups IV, V, and VI including refractory fiber metals such as tantalum (Ta) and niobium (Cb or Nb), comprising: forming a composite by impregnating a compacted refractory fiber metals including tantalum of 75 grams with matrix metal such as copper of 390 grams or about 16wt % fiber metal; deforming the composite to form a bulk matrix having a metal fiber or dendrite phase dispersed in a copper matrix phase; and leaching the matrix phase with nitric acid to produce separate fibers.

Fife fails to teach the use of casting including melting and cooling a mixture of copper and refractory fiber metals such as tantalum (Ta) and niobium (Cb or Nb).

However, either Raabe et al (page 156, left col. lines 12+) or Verhoeven et al (col. 3, lines 45+) teach the use of casting including melting and cooling a mixture of copper and refractory fiber metals including niobium or tantalum of 20 wt% (see examples 1-3) for the purpose of effectively forming a cast composite. It would have been obvious to one having ordinary skill in the art to provide Fife the use of melting and cooling a mixture of copper and refractory fiber metals including niobium or tantalum as taught by either Raabe et al or Verhoeven et al in order effectively control the fiber shape with high ratio of surface to weight in the produced fibers.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Kim et al.

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Fife in view of either Raabe et al or Verhoeven et al fails to teach the use of eutectic mixture. However, Kim et al (col.3, lines 3+) teach the use of eutectic temperature (col. 7, lines 30+), mixing pure Nb and bulk metallic glass and arc melting the mixture for the purpose of producing a two-phase microstructure containing intermetallic Nb fiber phase (dendrites) in an amorphous matrix. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al the use of eutectic mixture as taught by Kim et al in order effectively control the microstructure of the niobium fiber.

7. Claims 21 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Imaizumi et al.

Fife in view of either Raabe et al or Verhoeven et al fails to teach the use of C-103 as the fiber metal. However, Imaizumi et al (col. 3, lines 20+) teach the use of C-103 (niobium (Nb) based alloy containing Hf and Ti) for the purpose of increasing superconductive properties for the niobium fiber. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al the use of C-103 (niobium (Nb) based alloy containing Hf and Ti) as taught by Imaizumi et al in order effectively increase superconductive properties of the niobium fiber.

8. Claims 36 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Kumar et al.

Fife in view of either Raabe et al or Verhoeven et al fails to teach the use of a refractory fiber metal having an oxygen content below 1.5 wt%. However, Kumar et al (col. 4, lines 61+)

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teach the use a fiber metal of 100 pounds having an oxygen content below 300PPM or 0.03 wt% for the purpose of reducing defects in the deformed refractory fiber metal including niobium and tantalum. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al the use of a fiber metal having an oxygen content below 1.5 wt% as taught by Kumar et al in order effectively reduce defects in the deformed refractory fiber metal including niobium and tantalum.

9. Claims 38-39 and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Fife et al.

Fife in view of either Raabe et al or Verhoeven et al fails to teach the use of tree-like dendrite for the fiber phase. However, Fife et al (col. 7, lines 35, example 1) teach the use of tree-like dendrite (arms and fins see Figs. 3-4) for the tantalum fiber for the purpose of maximizing surface area and efficiency of electric performance (col. 7, lines 67+). It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al the use of the use of tree-like dendrite as taught by Fife et al in order effectively increase electric contact properties of the niobium fiber.

In claims 39 and 48, Fife in view of either Raabe et al or Verhoeven et al and further in view of Fife et al fails to teach the use of a particular value of surface area for the fiber phase. However, the use of surface area of at least  $2 \text{ m}^2/\text{g}$  for the dendrite in the fiber phase would have been obvious to one having ordinary skill fiber for the purpose of maximizing surface area and efficiency of electric performance.

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10. Claims 50, 54, 57, 60-61 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al.

Fife in view of either Raabe et al or Verhoeven et al fails to teach the use of processing the fiber phase including sintering. However, Gross et al (col. 3, lines 66+) teach the use of processing the fiber phase including sintering and mixing in a viscous fluid for the purpose of effectively making fibrillose preform. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al the use of processing the fiber phase including sintering as taught by Gross et al in order effectively making fibrillose preform.

11. Claims 51, 55, 58 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al and Villani.

Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al fails to teach the use of hydriding process. However, Villani (col. 3, lines 29+) teach the use of hydriding, dehydriding and crushing process (col. 13, lines 13+) for the purpose of effectively preparing powder for the fiber phase. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al the use of hydriding, dehydriding and crushing process as taught by Villani in order to prepare powder for the fiber phase.

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12. Claims 52, 56, 59 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al and Niegisch.

Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al fails to teach the use of freezing and shearing method for the fiber. However, Niegisch (col. 3, lines 30+) teaches the use of freezing and shearing method for the fiber for the purpose of making ultra-fine short fiber. It would have been obvious to one having ordinary skill in the art to provide Fife in view of either Raabe et al or Verhoeven et al and further in view of Gross et al the use of freezing and shearing method for the fiber as taught by Niegisch in order effectively make ultra-fine short fiber.

### *Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (8:00-5:30) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*I.H.L.*

I.-H. Lin

7-19-05

KEVIN KERNS  
PRIMARY EXAMINER

*Kevin Kerns 7/24/05*